

IN THE CLAIMS

Please amend claims 1, 3, 5-9, 13 and 18 as follows:

1 1. (Currently Amended) A method of compressing a video or
2 image, comprising the steps of:

3 defining a configuration space that models an optimal bit
4 allocation problem of a data compression process, the configuration
5 space defining nodes and transitions between the nodes, the nodes
6 corresponding to ~~the~~ a selection of respective quantizers for
7 respective features of a data stream, a path defined by a set of
8 transitions each connected at respective ones of said nodes to
9 another one of said set of transitions, said path joining a start
10 node and an end node and having a total cost corresponding to a sum
11 of costs of said transitions of said set of transitions;

12 propagating least-cost waves through said configuration space
13 by budding, responsively to a space-variant metric, such that a
14 first path of lowest found cost is identified through said
15 configuration space joining said start node and said end node; and

16 applying the quantizers corresponding to said nodes lying on
17 said first path to a first set of data to be compressed by said
18 data compression process.

1 2.(Original) A method as in claim 1, further comprising the
2 step of repeating said step of propagating such that a second path
3 of lowest found cost is identified and repeating said step of
4 applying in compressing a second set of data to be compressed by
5 said data compression process.

1 3.(Currently Amended) A method of compressing a video or
2 image, comprising the steps of:
3 defining a configuration space that models an optimal bit
4 allocation problem of a data compression process, the configuration
5 space defining nodes and transitions between the nodes, the nodes
6 corresponding to ~~the~~ a selection of respective quantizers for
7 respective features of a data stream, a path defined by a set of
8 transitions each connected at respective ones of said nodes to
9 another one of said set of transitions, said path joining a start
10 node and an end node and having a total cost corresponding to a sum
11 of costs of said transitions of said set of transitions;

12 propagating least-cost waves through said configuration space
13 by budding, responsively to a space-variant metric, such that a
14 first path of lowest found cost is identified through said
15 configuration space joining said start node and said end node;
16 repeating said step of propagating such that a second path of
17 lowest found cost is identified; and
18 comparing said lowest found costs of ~~said the~~ first and second
19 path and applying the quantizers corresponding to said nodes lying
20 on a lower cost one of said first and second paths in compressing
21 input data to be compressed by said data compression process.

1 4.(Original) A method as in claim 3, wherein said steps of
2 repeating and comparing are performed conditionally based upon an
3 allowed time interval for finding an optimal least cost path.

1 5.(Currently Amended) A method as in claim 3, wherein said
2 input ~~video~~-data includes video data and said cost is one of a
3 distortion of images of said video data and a bit rate of a data
4 stream resulting from said step of applying.

1 6.(Currently Amended) A data compression device, comprising:

2 a processor connected to receive a raw data stream and output
3 a compressed data stream;

4 said processor being programmed to determine optimal
5 quantizers by budding nodes of a configuration space that models an
6 optimal bit allocation problem of a data compression process, the
7 nodes corresponding to ~~the~~ a selection of respective quantizers for
8 respective features of a data stream, a path defined by a set of
9 transitions each connected at respective ones of said nodes to
10 another one of said set of transitions, said path joining a start
11 node and an end node and having a total cost corresponding to a sum
12 of costs of said transitions of said set of transitions;

13 said budding including propagating least-cost waves through
14 said configuration space responsively to a space-variant metric
15 such that a path of lowest found cost is identified through said
16 configuration space joining said start node and said end node;

17 said processor being programmed to apply the quantizers
18 corresponding to said nodes lying on said path of lowest found cost
19 in compressing said raw data.

1 7. (Currently Amended) A data compression device, comprising:

2 a processor connected to receive a raw data stream and output
3 a compressed data stream;
4 said processor being programmed to determine optimal
5 quantizers by budding nodes of a configuration space that models an
6 optimal bit allocation problem of a data compression process, the
7 nodes corresponding to ~~the~~ a selection of respective quantizers for
8 respective features of a data stream, a path defined by a set of
9 transitions each connected at respective ones of said nodes to
10 another one of said set of transitions, said path joining a start
11 node and an end node and having a total cost corresponding to a sum
12 of costs of said transitions of said set of transitions;
13 said budding including propagating least-cost waves through
14 said configuration space responsively to a space-variant metric
15 such that a first path of lowest found cost is identified through
16 said configuration space joining said start node and said end node;
17 said processor being programmed to further propagate further
18 cost waves to identify a second path of lowest found cost and to
19 compare said lowest found costs of ~~said~~ the first and second path
20 and apply the quantizers corresponding to said nodes lying on a
21 lower cost one of said first and second paths in compressing said
22 raw data.

1 8. (Currently Amended) A method of allocating bits for optimal
2 rate/distortion performance in digital data compression,
3 comprising:

4 determining a set of interconnected choices of quantizers for
5 each of a set of portions of a data stream in accord with said
6 digital data compression;

7 defining a starting one of said set of interconnected choices
8 and propagating least-cost waves beginning with said starting one
9 of said set of interconnected choices until a path defining all
10 necessary quantizers is found; and

11 implementing a data compression based upon at least some of
12 ~~said the~~ quantizer choices defined by said path.

1 9. (Currently Amended) A method as in claim 8, wherein said
2 step of determining includes determining a set of interconnected
3 choices of quantizers for each of a set of portions of a video data
4 stream.

1 10. (Original) A method as in claim 9, wherein said quantizers
2 include a quadtree decomposition of a video image.

1 11.(Original) A method as in claim 9, wherein said quantizers
2 include a quantizer for representing a motion vector field.

1 12.(Original) A method as in claim 8, wherein said quantizers
2 include a quantizer for quantizing differences between values in
3 said data stream.

1 13.(Currently Amended) A device for allocating bits for
2 optimal rate/distortion performance in digital data compression,
3 comprising:

4 a processor linked to a data stream and programmed to
5 determine a set of interconnected choices of quantizers for each of
6 a set of portions of a data stream in accord with said digital data
7 compression;

8 said processor being further programmed to define a starting
9 one of said set of interconnected choices and to propagate least-
10 cost waves beginning with said starting one of said set of
11 interconnected choices until a path defining all necessary
12 quantizers is found; and

13 said processor being further programmed to implement a data
14 compression process based upon at least some of ~~said~~ the quantizer
15 choices defined by said path.

1 14.(Original) A device as in claim 13, wherein said data
2 stream is a video data stream.

1 15.(Original) A device as in claim 14, wherein said
2 quantizers include a quadtree decomposition of a video image.

1 16.(Original) A device as in claim 14, wherein said
2 quantizers include a quantizer for representing a motion vector
3 field.

1 17.(Original) A device as in claim 13, wherein said
2 quantizers include a quantizer for quantizing differences between
3 values in said data stream.

1 18.(Currently Amended) A device for allocating bits for
2 optimal rate/distortion performance in digital data compression,
3 comprising:

4 a processor linked to a data stream and programmed to
5 determine a set of interconnected choices of quantizers for each of
6 a set of portions of a data stream in accord with said digital data
7 compression;

8 said processor being further programmed to define a starting
9 one of said set of interconnected choices and to propagate least-
10 cost waves beginning with said starting one of said set of
11 interconnected choices until a first path defining all necessary
12 quantizers is found;

13 said processor being further programmed to propagate least-
14 cost waves beginning with a lowest cost incomplete path until a
15 second path defining all necessary quantizers is found;

16 said processor being further programmed to implement a data
17 compression process based upon at least some of ~~said~~ the quantizer
18 choices defined by a lowest cost one of ~~said~~ the first and second
19 paths.

1 19.(Original) A device as in claim 18, wherein said data
2 stream is a video data stream.

1 20.(Original) A device as in claim 19, wherein said
2 quantizers include a quadtree decomposition of a video image.

1 21.(Original) A device as in claim 19, wherein said
2 quantizers include a quantizer for representing a motion vector
3 field.

1 22.(Original) A device as in claim 18, wherein said
2 quantizers include a quantizer for quantizing differences between
3 values in said data stream.